Habitat Expansion Agreement

for

Central Valley Spring-Run Chinook Salmon and California Central Valley Steelhead

Questionnaire Instructions

The attached questionnaire is intended to solicit information needed by the Steering Committee to review projects relative to the criteria established in the Habitat Expansion Agreement. For each proposed action (project), please complete the questionnaire to the fullest extent possible. Please provide citations where applicable and provide a full reference for each citation at the end of this questionnaire (Section X. Supporting Documents). Specific instructions follow.

I. Contact Information

Provide the name of the agency or group making the proposal as well as a contact person for the project. Include contact information such as mailing address, phone number, and email address.

II. Project Description

Provide a descriptive name for the action (project). If the action is listed in the *Working List of Potential Habitat Expansion Actions* (provided during the January 2009 meetings of HEA parties), please include the reference number associated with the action. The project location should specify the watershed or subwatershed (e.g., Deer Creek, Beegum Creek) as well as specific areas within the watershed where the project will be located and what portions of the watershed will benefit from the project. Please include geographic coordinates of the project location(s), if applicable. The project description should be a narrative that provides as much detail as possible about the project.

III. Species Limiting Factors

In this section, indicate the factors that currently limit production of spring-run Chinook salmon and/or steelhead in your watershed. The intent is that the environmental and biological objectives of your project address these limiting factors in some way. Please check one or more of the limiting factors that apply to your watershed. In the second column, describe how and where the factor limits spring-run Chinook salmon and/or steelhead. For each factor that you check, please rank its effect on spring-run Chinook salmon and/or steelhead using the drop-down box in the last column. Finally, we also ask that you describe the source of your conclusions, such as a watershed assessment or other document. Please provide enough information that we can find the document if we need it.

IV. Project Objectives—Environmental

Environmental objectives describe how the project is intended to address the limiting factors to achieve the biological objective described in the next section. Environmental objectives should be as specific and quantitative as possible (e.g., reduce gravel embeddedness in the watershed from 75% to 25% by fencing riparian areas to exclude cattle and allow riparian forest to reestablish). Describe how you think environmental objectives relate specifically to the biological objectives. In the last column, we ask you to describe the environmental objectives as either the primary or secondary focus of the project. For example, a project to plant trees might have a primary focus on riparian/floodplain function with a secondary focus on temperature or water quality.

V. Project Objectives—Biological

Biological objectives describe the anticipated biological response from the project and should be as quantitative as possible. Indicate which species and life stages are the focus of the project. Describe specifically the general condition of the target species in your watershed relative to the historical abundance. The condition of the species should be indicated using the categories in the drop-down box. Species condition categories are defined on the last page of this form. Biological objectives should include the following information: (1) an estimate of the expected contribution of the project in terms of potential adult returns, to the extent possible (and an explanation of how the estimate was developed); and (2) an explanation of how the biological objective for the species is addressed by the action relative to the environmental limiting factors (e.g., the biological objective of an action might be to increase egg incubation survival in a watershed that is currently limited by sediment levels).

VI. Project Cost

To the extent possible, estimate the capital cost of the project, the annual operating and maintenance (O&M) cost, a description of annual O&M activities, and the project lifetime (i.e., how many years O&M activities are expected, including indefinitely, and how long until you expect the project to provide benefits). Provide any confirmed or potential funding partners, or opportunities for cost sharing with other funders or between projects. Also, identify any confirmed or potential partners that might provide maintenance support for the project (funding support or labor support).

VII. Schedule

Describe the project schedule, including a potential start date, construction period, and environmental and biological response times (i.e., the expected time to realize environmental and biological benefits). The last points refer to the maturation period for the project during which time environmental conditions develop. For example, it may take 50–100 years before full environmental benefits (e.g., shading, channel stability, water quality) of planting riparian trees are realized.

VIII. Feasibility

Describe the feasibility and challenges of the project. Feasibility issues should include primarily technical issues, success of projects utilizing similar technology, and particular challenges posed by the specific project. Other issues of feasibility that may be included are challenges associated with property ownership, permitting, zoning, and other social-economic-legal issues.

IX. Project Support

Describe the support or potential conflicts associated with the project. Specifically, provide supporting and cooperating entities (e.g., agencies, non-governmental organizations). Are there cooperating agencies or groups, aside from the potential funding partners mentioned previously? Describe the degree of local support and any known opposition or conflicts with other parties.

X. Supporting Documents

Provide full references for each citation used to support the information presented in this questionnaire for your project. At a minimum, a reference should include the author(s) name; name of agency/organization (if applicable); title of the document; volume and title of journal, if the document is taken from a professional journal; and publisher, date, and location of publication.

Questionnaire

for

Information on Potential Projects to Support Spring-Run Chinook Salmon and Steelhead in the Sacramento River Basin for the Habitat Expansion Agreement

DUE: Thursday, April 30, 2009

Send completed questionnaires to hea@water.ca.gov

I. Contact Information

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II. Project Description

Project Name:	Yuba River Narrows Spawning Habitat Rehabilitation
Reference No. or New:	Basically, same as "Narrows Rehabilitation" project submitted by CDFG and FWS
Project Location:	Yuba River (0.8 miles below Englebright and immediately upstream of Deer Creek) 39deg 13' 50 N 121deg 16' 37 W

Project Description:

Compared to historic conditions, spring-run Chinook and steelhead populations of the Yuba River are severely limited by blockage from Englebright Dam. The spring-run Chinook population of the Yuba River is at high risk of extinction due to average annual abundance <500 fish, strays from the Feather River Hatchery and inadequate spawning segregation from the fall-run population. This project would restore habitat in the reach below Englebright Dam where spring-run Chinook are known to hold and attempt spawning despite a lack of suitable spawning habitat. This project may also involve a segregation weir approximately 6 miles below Englebright to provide spawning segregation from non-natal and fall-run salmon. The need and benefits for the segregation weir

II. Project Description

component of the project can be more completely evaluated following results from ongoing studies by the Yuba Accord RMT involving tagging, tracking, redd mapping and genetic analysis. Dr. Greg Pasternak of UC Davis has thoroughly described the physical situation in the Englebright Dam Reach (EDR). Although the Armcy Corps of Engineers is required to implement a gravel augmentation program, no such program will provide benefits to salmon and steelhead until the channel is rehabilitated from instream gravel mining and deposition of shot rock. With rehabilitation and the provision of 100,000 tons of gravel, the Englebright Dam Reach could support at least 2000 spawning spring-run Chinook. Gravel supply would then be maintained as per requirements of the Corps. The benefits of this project, for steelhead in particular, would be expanded with gravel augmentation in Deer Creek which enters the reach near the location of highest potential for spawning habitat enhancement.

III. Species Limiting Factors

In this section, describe the limiting factors for spring-run Chinook salmon and steelhead in your watershed. The last page of this questionnaire defines the limiting factors.

Limiting Factors	Description (from back page)	Rank
☒ **Channel Form**	Instream gravel mining and deposition of shot rock has made the channel at the project location unsuitable for spawning, even with restoration of annual gravel supply. More generally, the channel form in the lower Yuba is affected by lack of gravel supply in upper reach (i.e. downcutting) and artificial confinement from RM 7 to RM 21 (goldfields) resulting from walls of mine tailings.	High
☐ **Channel Unit Types**		Select Rank
☒ **Substrate**	Englebright Dam blocks transport of all gravels into the channel below. Spawning habitat exists beginning two miles below the dam as material becomes entrained from historic terraces and mine tailings	High
☒ **Structure**	see note below	Medium
☐ **Flow**		Select Rank
☐ **Temperature**		Select Rank
☐ **Water Quality**		Select Rank
☒ **Passage**	Englebright Dam blocks access to the majority of spawning habitat in the watershed for spring-run and steelhead; No segregation provided for spawning of spring-run.	High
☒ **Riparian/Floodplain**	see note below	Medium

Source Documents:

Pasternack Manuscript on Englebright Dam Reach, Draft Implemention Plan for Lower Yuba River Anadromous Fish Restoration, Recovery Plan for Central Valley Spring-run Chinook and Steelhead (Co-manager Draft).

Additional Notes:

For description and sources for structure and riparian/floodplain as limiting factors in the lower Yuba River, see submitted information for Yuba River Rearing Habitat Enhancement

IV. Project Objectives—Environmental

In this section, describe how your project will affect one or more of the limiting factors for spring-run Chinook salmon or steelhead described above.

Limiting Factor	Description and Objective	Focus
☒ **Channel Form**	Rehabilitation of channel form by shot rock removal and regrading as necessitated following final analysis of alternatives	Primary
☐ **Channel Unit Types**		Select Focus
☒ **Substrate**	Placement of 100,000 tons of spawning gravel to be followed by program of gravel augmentation/maintenance by the Army Corps	Primary
☒ **Structure**	Through association with Yuba River Rearing Enhancement Project	Secondary
☐ **Flow**		Select Focus
☐ **Temperature**		Select Focus
☐ **Water Quality**		Select Focus
☒ **Passage**	Through association with Deer Creek Gravel Augmentation and Passage Project submitted by Friends of Deer Creek	Secondary
☒ **Riparian/Floodplain**	Through association with Yuba River Rearing Enhancement Project	Secondary

V. Project Objectives—Biological

In this section, describe the objective(s) of your project relative to the goal of providing habitat for spring-run Chinook salmon and steelhead. Indicate the species and life stage that are targeted by the project. (It is okay to have more than one species/life stage target).

Target Species: ☒ Spring-Run Chinook Salmon **Population Status Specific to Watershed:** Decreasing

Target Life Stages:

☒ Spawning ☒ Egg Incubation ☒ Summer Rearing ☐ Winter Rearing

☐ Juvenile Emigration ☐ Adult Immigration ☐ Adult Holding

Description of Project Objectives:

Provide spawning habitat in the Englebright Dam Reach of the Yuba River to support 2000 or more spring-run Chinook salmon and enhance juvenile productivity. Also, to provide spatial segregation during spawning from summer immigrants and fall-run Chinook as needed to protect phenotypically or genetically distinct spring-run Chinook. Note: Based on results from gravel placement in Mokelumne River (Joe Merz, personal communication), 100,000 tons of gravel could be sufficient to support this spawning population and greatly enhance production of macroinvertebrates representing food sources for juvenile salmonids.

V. Project Objectives—Biological

Target Species: ☒ Steelhead

Population Status Specific to Watershed: Decreasing

Target Life Stages:

☒ Spawning ☒ Egg Incubation ☐ Summer Rearing ☐ Winter Rearing

☐ Juvenile Emigration ☐ Adult Immigration

Description of Project Objectives:

Increase the availability of suitable spawning and incubation habitat in the Narrows reach of the Yuba River, to provide for increased spawning success and juvenile productivity for steelhead. Also, this project is complimentary with gravel augmentation in Deer Creek (as proposed by Friends of Deer Creek) which could provide additional benefits in the confluence area for both species and more than 4 miles of expanded spawning and rearing for steelhead.

VI. Project Cost

Capital Cost:	$3.1M for habitat rehabilitation (based on $30/ton placed gravel plus engineering and design), plus $ 219,000 for weir
Annual Operation and Maintenance Cost:	$52,000 annually for weir operation and monitoring
Annual Operation and Maintenance Description:	The Corps is obligated to provide sufficient gravel to channel below Englebright to maintain habitat at no cost to project (estimated by Pasternak to be 10,000 tons). Segregation weir would involve full-time staff for 3.5 months/year plus assembly and disassembly.
Project Lifespan:	30 years
Project Partners (Funding):	PG&E (tbd per Narrows Mitigation Fund), FWS (AFRP)
Project Partners (Maintenance):	Army Corps (tbd for gravel augmentation/maintenance); Yuba County Water Agency (tbd for support of weir and monitoring)

VII. Schedule

Proposed Start:	2010
Expected Time to Completion:	2 months for construction period
Expected Time to Realize Environmental Benefits:	2011
Expected Time to Realize Biological Benefits:	2011

VIII. Feasibility

Technical Feasibility:	Similar spawning habitat rehabilitation has been conducted in the Central Valley, including on the Mokelumne and Tuolomne Rivers. Resistance board segregation weirs are versatile and used by fisheries managers throughout the region. Cramer Fish Sciences staff, who pioneered the use the technology in California, has provided reconnaissance and confirmed feasibility on the Yuba River. For more information, see their resistance board weir website at http://weir.fishsciences.net.
Technical Challenges:	The Yuba River has limited flood control above Englebright and constructed spawning channels will be subject to scouring forces. Additional analysis is required to determine appropriate site rehabilitation techniques before gravel placement. For example, complete shot rock removal may not be required. Also, shot rock near the dam must be stabilized to prevent future impacts.
Related Projects:	Gravel augmentation proposed by Friends of Deer Creek would add substantially to the amount of expanded steelhead habitat in this area. Restoration of off-channel rearing habitat in the Parks Bar to Hammon reach of the Yuba River (as proposed by USFWS and SYRCL) would address a limiting factor for spring-run Chinook and steelhead juveniles. The Corps of Engineers is required by a NMFS BiOp to implement a program of gravel augmentation by the fall of 2012. However, this program is not likely to start before site rehabilitation for which no entity has been made responsible. Nevertheless, the Corps program should be solidified before completion of this project.
Ownership or Permitting Challenges:	Access to rehabilitation site requires either permission from two private landowners so far offering less than consistent support, or construction of road on steep slopes of PG&E mitigation land. CDFG has expressed concerns about the new road and immediate impacts of the project on holding spring-run salmon.
Conflicts with Cultural, Zoning, or Other Issues:	None determined

IX. Project Support

Supporting Entities:	FWS, CDFG, NMFS, SYRCL; PG&E support to be determined.
Cooperating Entities:	Friends of Deer Creek, UC Field Station; Yuba County Water Agency cooperation to be determined.
Degree of Local Support:	Yuba County Resource Conservation District has proposed a pilot phase of this project for funding by the Sierra Nevada Conservancy. This project is expected to have a high degree of local support because it recovers spring-run and steelhead populations without altering water management, recreation or access. If used, a segregation weir would block only the relatively small portion of salmon attempting to migrate into the upper reach from July 1 to October 15.
Known Opposition:	The segregation weir component will have opposition without data to demonstrate lack of sufficient natural segregation. One of two immediate landowners in the rehab location may prove oppositional.

X. Supporting Documents

Please provide a full reference for each citation used to support the information presented in this questionnaire.

Pasternack and others, Manuscript 2009, Historical Analysis of the Englebright Dam Reach of the Lower Yuba River, CA to Aid Spring-run Chinook Salmon Habitat Rehabilitation.

Shira-based river analysis and field-based manipulative sediment transport experiments to balance habitat and geomorphic goals on the Lower Yuba River. http://pasternack.ucdavis.edu/LYR3_Pasternack_FINAL.pdf

NMFS, Central Valley Spring-run and steelhead recovery plan (co-manager draft)

Draft Implementation Plan for Lower Yuba River Anadromous Fish Habitat Restoration. October 2005. Lower Yuba River Fisheries Technical Working Group. CD Distribution

Merz JE, Ochikubo Chan LK. 2005. Effects of gravel augmentation on macroinvertebrate assemblages in a regulated California river. River Research and Applications 21: 61–74. DOI: 10.1002/rra.819

Merz JE, Setka JD, Pasternack GB, Wheaton JM. 2004. Predicting benefits of spawning habitat rehabilitation to salmonid fry production in a regulated California river. Canadian Journal of Fisheries and Aquatic Science 61: 1433–1446. DOI: 10.1577/M03-038.1

Definitions of Limiting Factors for Spring-Run Chinook Salmon and Steelhead

Channel Form

This attribute describes changes to the channel, including incision, aggradation, diking, armoring, and other modifications of the channel adversely affecting spring-run Chinook salmon and steelhead.

Channel Unit Types

Examples of geomorphic features of the channel that form habitat types for spring-run Chinook salmon and steelhead are pools, riffles, glides, and runs. This attribute describes changes in the frequency and size of such features. For example, removal of large wood may reduce the frequency of pools, presence of steps, or retention of gravel for riffles.

Substrate

This attribute describes changes in the composition of the substrate of the stream, including increase in fine sediment and lack of gravel recruitment.

Structure

This attribute describes the loss of structural elements in the stream such as large wood, boulders, undercut banks, and so on. Loss of structure results in a simplification of the channel and influences Channel Form and Channel Unit Types.

Flow

This attribute addresses modification of the flow regime, including decrease in summer low flow, increased "flashiness," and dewatering of the channel as a result of withdrawals.

Temperature

Change in water temperature can be attributable to human actions such as removal of riparian shading. This attribute describes the increase in summer water temperature and the loss of temperature refugia (springs or groundwater) as a result of human actions.

Water Quality

This attribute pertains to the input to the stream of toxins or pollutants that produce adverse impacts on spring-run Chinook salmon or steelhead. This can include chemical pollutants such as fertilizer and pesticides and nutrient sources such as cattle and feedlots.

Passage

This relates to the effect of impediments to adult or juvenile migration of spring-run Chinook salmon or steelhead, including dams, culverts, channel dewatering, and other structural and channel modifications. Please describe the location of the passage impediment and describe the extent of impediment (i.e., a complete or partial blockage to migration).

Riparian/Floodplain

This attribute describes the loss of functionality of the riparian forest/vegetation and the connection of the stream to the floodplain during high water and flooding.

Population Condition Definitions for Section V. Project Objectives—Biological

Increasing

Adult returns of the target species to the watershed have generally been increasing over the last several years; expectations are that the species is displaying characteristics of a rebuilding or healthy population.

Stable

Adult returns of the target species to the watershed show no clear trend over the last several years.

Decreasing

Adult returns of the target species to the watershed are declining over the last several years; the decline in abundance is a cause of concern and characteristic of a potentially unhealthy population.

Intermittent

Adult returns of the target species are occasionally seen in the watershed, but there is no viable or sustained population in the basin.

Extirpated

The population has been eliminated from the watershed although the species was present in the past.

Never Present

The species has never been known to occur in the watershed.